# 2016 QUALITY ASSURANCE PROJECT PLAN UPDATE

# CLAM TISSUE SAMPLING

## WYCKOFF/EAGLE HARBOR SUPERFUND SITE
## Bainbridge Island, WASHINGTON

***EPA CERCLIS SITE ID# WA009248295***

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**TITLE AND APPROVAL SHEET**
**2016 CLAM TISSUE SAMPLING**
**QUALITY ASSURANCE PROJECT PLAN (QAPP) UPDATE**
**WYCKOFF/EAGLE HARBOR SITE, BAINBRIDGE ISLAND, WASHINGTON**

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# QUALITY ASSURANCE PROJECT PLAN AMENDMENT

This Quality Assurance Project Plan (QAPP) update (to the 2014 QAPP) describes the third clam tissue sampling activities which are a part of the existing monitoring for the Wyckoff/Eagle Harbor Superfund Site remedy. The Wyckoff/Eagle Harbor Superfund site is located on the southern shoreline near the entrance to Eagle Harbor and has four operable units. This QAPP addresses clam sampling within the East Harbor Operable Unit 01 that includes intertidal and subtidal sediments of the site. The remedy for the Wyckoff/Eagle Harbor Superfund Site included: placement of a clean sediment cap over approximately 50 acres of contaminated subtidal and intertidal sediments in the East Harbor. The QAPP update is based on the *Intergovernmental Data Quality Task Force Uniform Federal Policy for Quality Assurance Project Plans Guidance (EPA 2009)*. Data from the clam tissue sampling activities will be included in the next Five Year Review.

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# ATTACHMENTS **(refer to QAPP April 2014)**

## LIST OF ACRONYMS

| | |
|---|---|
| EPA | United States Environmental Protection Agency |
| EIM | Environmental Information Management |
| GPS | Global Positioning System |
| HHRA | Human Health Risk Assessment |
| HPAH | High-molecular weight PAHs |
| MEL | EPA R10 Manchester Environmental Laboratory |
| MRL | Method Reporting Limit |
| PAHs | Polycyclic Aromatic Hydrocarbons |
| PDT | Project Delivery Team |
| PQOs | Project Quality Objectives |
| QAPP | Quality Assurance Project Plan |
| QC | Quality Control |
| ROD | Record of Decision |
| RSCC | Regional Sample Control Coordinator |
| SOP | Standard Operating Procedure |
| SSHP | Site Safety & Health Plan |
| TEQ | Toxic Equivalent Quantity |
| µg/kg | Microgram per kilogram |
| USACE | United States Army Corps of Engineers |

# 1. PROJECT MANAGEMENT AND OBJECTIVES

## 1.1. Project Organization, Responsibilities and Authority

This update describes changes to the Quality Assurance Project Plan (QAPP) for clam tissue sampling that was approved and implemented in May 2011 and amended in April 2014. Changes from the previous QAPP include the timeframe when sampling is conducted and the use of Scribe software for sample management. Sample handling and analytical procedures remain the same and the reader should review the May 2011 QAPP along with Amendment 1 dated April 2014. The Project Delivery Team (PDT) for this QAPP update includes members from United States Environmental Protection Agency Region 10 (EPA), the United States Army Corps of Engineers (USACE), and the Suquamish Tribe. Funds for this project have been secured through the Comprehensive Environmental Response, Compensation and Liability Act cleanup program.

The roles of the project team members are the same as the previous QAPP.

### 1.1.1. EPA Region 10 Personnel Responsibilities and Qualifications (refer to QAPP April 2014)

### 1.1.2. USACE Personnel Responsibilities and Qualifications (refer to QAPP April 2014)

The USACE project manager has changed from Karl Kunas to Robert Yust and the technical lead has changed from Deborah Johnston to Marlowe Laubach. The USACE chemist has changed from Cathy Martin to Jacob Williams. Jacob Williams will also be the USACE Scribe Manager.

### 1.1.3. Special Training Requirements and Certifications (refer to QAPP April 2014)

## 1.2. Project Planning

### 1.2.1. Project Planning (Scoping)

Several meetings have been held with EPA, the Suquamish Tribe and USACE PDT members. Topics discussed include:

- Project Schedule
- Data Collection for the Next Five Year Review

The outcomes of the meetings are documented by incorporation into this updated QAPP.

### 1.2.2. Problem Definition, Site History, and Background (refer to April 2014 QAPP for additional details)

The Wyckoff/Eagle Harbor Superfund site is located on the east side of Bainbridge Island, in Central Puget Sound, Washington. The East Harbor Operable Unit 01 consists of more than 70 acres of intertidal and subtidal habitats that were contaminated by releases of creosote and other

wood-treating chemicals from a now defunct wood treating plant. The releases contaminated the bottom sediments of Eagle Harbor, primarily with polycyclic aromatic hydrocarbons (PAHs).

Eagle Harbor is within the usual and accustomed fishing area of the Suquamish Tribe.

The work for this updated QAPP supports the following:

1. Obtain clam tissue sampling data for contaminants of concern described in the Record of Decision (ROD).
2. Determine if clam tissue contamination levels have changed due to natural recovery.
3. Collect site-specific background clam tissue data.

Clam tissue PAH concentrations will be used in the next Five-Year Review and to update sampling locations and procedures as appropriate. The work is expected to be completed during the low tides in July 2016. Collection and analysis will assist EPA to assess the natural recovery process. The ROD states that monitoring is necessary to document natural recovery.

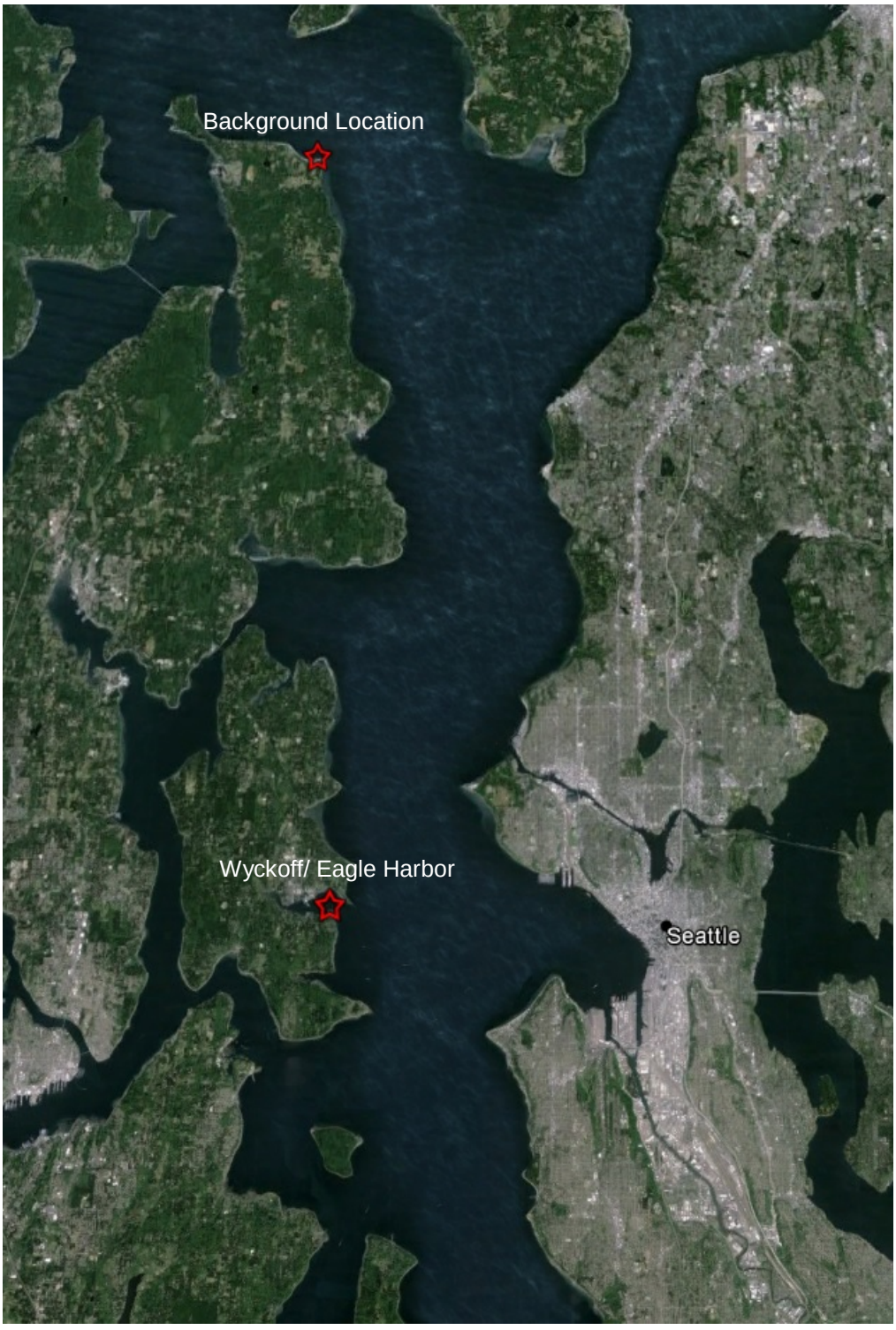


**Figure 1. Sampling Location Vicinity Map**


**Figure 2. Wyckoff/Eagle Harbor Vicinity Map**


**Figure 3. Wyckoff Sampling Locations**


**Figure 4. Background Location**

#### 1.2.2.1 Remedy and Status (refer to QAPP April 2014 for additional information)

This monitoring event is designed to provide additional data on clam tissue PAH concentrations over time. Clams will be collected from all beach locations and analyzed for PAH concentrations and lipid content. The data may be of sufficient quality to determine if concentrations have changed when compared to the previous clam tissue data and provide data sufficient to support future human health risk assessment (HHRA).

Native horse clams (*Tresus capax*) will be collected from approximately the same locations as during the previous two monitoring event in Eagle Harbor. In addition, native horse clams (*T. capax)* will be collected from a background location in Puget Sound. Clams will be collected and analyzed for PAH tissue concentrations and percent lipid content. A minimum of 100 grams of clam tissue (whole body without shell) is required for each composite for analysis of PAH and lipids. Based on the clam weights from the 2014 monitoring event in Eagle Harbor it is approximated that three clams of legal size (5 inches and having 78 grams of shucked tissue each) will provide the 20 grams of tissue needed for the PAH analysis (10 grams) and lipid determination (10 grams) from each sample location. Samples designated for duplicates, matrix spike and matrix spike duplicates will need at least 40 grams of homogenized material.

## 1.3. Project Quality Objectives and Measurement Performance Criteria

### 1.3.1. Development of Project Quality Objectives Using the Systematic Planning Process

Project Quality Objectives (PQOs) are developed through the systematic planning process as described in the UFP-QAPP Guidance. They are used for determining the type, quantity, and quality of data as described in Table 1.

**Table 1. Project Quality Objectives**

| **Project Quality Objectives - Wyckoff /Eagle Harbor Clam Tissue Sampling** | | | |
|---|---|---|---|
| Problem Statement | Investigation Method | Performance Criteria | Data Use |
| 1. How is the Natural Recovery remedy affecting PAH tissue concentrations in horse clams? | Collect horse clams from the 4 beach segments in July 2016: West Beach, Intertidal Cap, North Shoal, East Beach. Those sample concentrations will be compared to the tissue concentrations from the previous sampling events. A background location will be added for | Analyze harvestable size horse clam tissue for PAHs and lipid content. PAH laboratory reporting limits will be at the 1 µg/kg MRL or better. | Are tissue concentrations declining over time? If yes, this will indicate that monitored natural recovery is still occurring. 2016 sampling results will provide current data against which post-remediation data can be compared. |

| Project Quality Objectives - Wyckoff /Eagle Harbor Clam Tissue Sampling | | | |
|---|---|---|---|
| Problem Statement | Investigation Method | Performance Criteria | Data Use |
| | comparison to tissue concentrations from the 4 beach segments. | | |
| 2. Are the tissue PAH concentrations at West Beach different from concentrations at the other 3 segments? | Compare tissue PAH concentration from West Beach clams to each of the other segments PAH tissue concentrations. | Analyze edible horse clam tissue for PAHs and lipid content. PAH laboratory reporting limits will be at the 1 µg/kg limit or better. | Do clams that have settled at West Beach (a clean habitat) have PAH concentrations lower than clams from the other beaches? If yes, this will indicate that a sediment removal remediation (to reduce the concentration of PAHs in sediments) may be considered as another remedy to natural recovery. |
| 3. Is there sufficient data to calculate a HHRA for subsistence users eating horse clams? | Determine the appropriate parameters for use in a HHRA regarding consumption rates. Analyze horse clam tissue for HPAHs and lipids. | Reporting limits are above the ideal method reporting limits for calculating the TEQ[1]. However, this is acceptable for the project to look at contaminant concentration trends. | Calculate PAH concentrations (TEQ) in clam tissues and use the results to calculate the risk of shellfish consumption at recreational and Tribal consumption levels. |
| 4. How does the tissue PAH concentrations at the 4 beach locations compare to background areas in Puget Sound? | Collect samples in a suitable background location to build the background data set. Compare tissue PAH concentrations to background. | Analzye edible horse clam tissue for PAHs and lipid content. PAH laboratory reporting limits will be at the 1 µg/kg limit or better. | Perform a statistical comparison between the background areas and site. |

[1] The TEQ will be calculated for carcinogenic PAHs using the potency factors from the 1993 EPA Provisional Guidance for Quantative Risk Assessment of PAHs. Detections between the method reporting limit/limit of quantitation and the limit of detection should be qualified with a "J".

**Table 2. Project Data Needs (Remedy Perspective)**

| Data Need | | Data Use | | Number or Frequency of Primary Samples | Concentration of Interest; Sensitivity of Measurement | Remediation Area(s)/Sample Location(s) |
|---|---|---|---|---|---|---|
| Target Analyte or Characteristic of Interest | Matrix | Remedy Method of Interest | Criteria to be Considered | | | |
| **Remedy Perspective** | | | | | | |
| PAHs | Tissue | Sediment Cover | Conceptual Site Model | 12 | 1 µg/kg (wet weight) | Wyckoff/Eagle Harbor intertidal areas |
| Lipid | Tissue | | | 12 | Top-loading balance: ±2% or ±0.02g, whichever is greater | |
| PAHs | Tissue | Background | Conceptual Site Model | 3 | 1 µg/kg (wet weight) | background location |
| Lipid | Tissue | | | 3 | Top-loading balance: ±2% or ±0.02g, whichever is greater | |

#### 1.3.2. Measurement Performance Criteria (refer to QAPP April 2014)

### 1.4. Secondary Data Evaluation (refer to QAPP April 2014)

### 1.5. Project Overview and Schedule

Through project planning, the project team has agreed on the purpose of the project, the environmental questions that are being asked, and the environmental decisions that must be made. PQOs have been developed specifying the type, quantity, and quality of data needed to ensure that project data can be used for the intended purpose to answer specific environmental questions, support environmental decisions, and determine technical activities that will be conducted. Table 3 provides a summary of the project tasks to be completed and Table 4 describes the project schedule.

**Table 3. Project Tasks**

| |
|---|
| **Plan, Prepare QAPP** |
| • Prepare an updated QAPP and a site-specific Site Safety Health Plan (SSHP) to govern the sampling<br>• Prepare, finalize, and approve updated QAPP |
| **Sampling Tasks** |
| • Sample clams at 15 intertidal sample locations |
| **Analytical Tasks** |
| • Analyze all clam tissue PAH samples by Quechers extraction and EPA Method 8270D with GC-MS-MS<br>• Analyze lipids gravimetrically by EPA Method 3541C ($MeCl_2$ extraction) per MEL SOP |
| **Quality Control Tasks** |
| • Tissue (PAH and lipids) samples will have 1 duplicate for each beach location and one MS/MSD sample.<br>• Analytical methods QC will comply with laboratory SOPs. |
| **Secondary Data** |
| • No secondary data will be collected. |
| **Data Management Tasks** |
| • EPA Scribe software will be used for data management as per R10 Data Management Plan<br>• Validated/verified analytical data and sample coordinates will be placed in the EQuIS™ database. Data from the Scribe format will be available for input into the EIM database. |
| **Documentation and Records** |
| • Follow EPA R10 Data Management Plan for collection of field data including use of Scribe<br>• All generalized sample locations will be recorded in field notebook.<br>• Field notebook will contain the following: date and time of sample collection, weather conditions, sample identification number, type of sample, general location of sampling points (GPS), depth of clams below the beach surface, and any procedural steps taken that deviate from those outlined in this updated QAPP.<br>• Prepare a Final Monitoring Report that describes the field effort, sampling results and data quality, decisions made, and recommendations for future actions. |
| **Data Packages** |
| • 100% of data packages will be validated through Stage 4 (S4VM) by EPA MEL. All data packages will be delivered to USACE and maintained at MEL at the Stage 4 level. |
| **Assessments and Audits** |
| • Sampling SOPs have been reviewed.<br>• Field sampling records will undergo review after the samples are collected.<br>• Laboratory sample receipt reports will be reviewed after samples are received.<br>• Scribe files and deliverables will be verified by the EPA RSCC and MEL upon receipt (R10 Data Management Plan 4/2014). |

| **Data Review Tasks** |
|---|
| • The laboratory performing analyses of samples will verify that all data are complete for samples received.<br>• Data will be validated undergo a full data quality review in accordance with the EPA MEL review policies and SOPs.<br>• Validated data will be reviewed by USACE.<br>• Data usability will be assessed by USACE.<br>• Measurement performance criteria set in QAPP checked by USACE.<br>• Data limitations will be determined. Data compared to PQOs by USACE. |

**Table 4. Estimated Project Schedule**

| Task #:Description | Start | Finish |
|---|---|---|
| **Task #1: Plan, Prepare QAPP** | | |
| Prepare amended QAPP and SSHP | 3/28/2016 | 4/15/2016 |
| Submit amended QAPP for comments and receive comments | 5/17/2016 | 6/7/2016 |
| Final amended QAPP approval | 6/22/2016 | 6/24/2016 |
| **Task #2: Field Work (Collect Clams, Transport to MEL)** | | |
| Collect clams and submit to EPA Manchester lab | 7/05/2016 | 7/06/2016 |
| **Task #3: Review Lab Data and Prepare Monitoring Work** | | |
| Analysis turnaround anticipated | 7/06/2016 | 7/27/2016 |
| Review lab data and prepare data quality reports | 7/27/2016 | 8/10/2016 |
| Prepare draft monitoring report | 7/27/2016 | 8/26/2016 |
| USACE internal review comments due | 8/26/2016 | 9/2/2016 |
| Prepare draft final monitoring report | 9/6/2016 | 9/16/2016 |
| EPA/Tribe review | 9/19/2016 | 10/3/2016 |
| Prepare Final Monitoring Report | 10/4/2016 | 10/14/2016 |

# 2. MEASUREMENT AND DATA ACQUISITION

## 2.1. Sampling Tasks

### 2.1.1.Sampling Process Design and Rationale (refer to QAPP April 2014)

### 2.1.2.Sampling Procedures and Requirements (refer to QAPP April 2014)

## 2.2 Analytical Tasks (refer to QAPP April 2014)

## 2.3 Sample Collection Documentation, Handling, Tracking and Custody Procedures (refer to QAPP April 2014)

## 2.4 Quality Control Samples (refer to QAPP April 2014)

Sufficient sample mass shall be collected to include the following QC samples.

| Laboratory QC Sample Requirements | | | | | |
|---|---|---|---|---|---|
| **Analytical Parameter** | **# Sample Duplicates (grams)** | **% Sample Duplicates (min. approx 10%)** | **MS/MSDs** | **%MS/MSD (min. 5%)** | **Laboratory Triplicate RSD** |
| PAHs | 1 (10g) | 8.3% | 1 (20g) | 8.3% | NA |
| % Lipids | 1 (10g) | 8.3% | NA | 8.3% | 1 sample (30g) |

### 2.5 Data Management Tasks (refer to QAPP April 2014)

#### 2.5.1 Project Documentation and Records (refer to QAPP April 2014)

##### 2.5.1.1 Amended QAPP and Site Safety and Health Plan

Hardcopies of the updated QAPP and SSHP will be stored in project files.

#### 2.5.2 Data Package Deliverables (refer to QAPP April 2014)

#### 2.5.3 Electronic Data Reporting Formats (refer to QAPP April 2014)

#### 2.5.4 Data Handling and Management (refer to QAPP April 2014)

#### 2.5.5 Data Tracking and Control (refer to QAPP April 2014)

## 3. ASSESSMENT AND OVERSIGHT (refer to QAPP April 2014)

## 4. OVERVIEW (refer to QAPP April 2014)

## 5. REFERENCES

U.S. Environmental Protection Agency. 2009. *Intergovernmental Data Quality Task Force Uniform Federal Policy for Quality Assurance Project Plans Guidance*